

ABSTRACT

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The invention relates to a computer system and method for simulating transport
5 phenomena in a complex system. The computer system comprises memory means,
storage means, and an object-oriented software product. The software product
comprises an object-oriented extensible class hierarchy comprising a first set of
generic classes that represent a plurality of object types and a second set of generic
classes that represent member variables for the object types. The extensible class
10 hierarchy permits the addition of additional object types or additional member
variables without any modifications to the class hierarchy itself. The invention is
particularly useful in simulating a hydrocarbon system that may include one or more
of the following: a subterranean hydrocarbon-bearing formation, injection wells that
penetrate the formation, production wells that penetrate the formation, surface
15 flowlines, associated aquifers, and surface fluid processing facilities.

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